

REMARKS

Claims 1- 25 are currently pending. Claims 23 and 24 are indicated as withdrawn from consideration on the PTOL-326 cover sheet of the Official Action but included in the prior art rejections. As such, the Examiner is requested to indicate in the next Official Action that the restriction requirement has been withdrawn.

Applicants respectfully request reconsideration of the application in response to the non-final Office Action.

Claim Rejections – 35 U.S.C. §103(a)

Claims 1-6, 7-9, 14-16, 23 and 24 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Hubacek (US 6,475,336) in view of Masuta et al. (US 6,277,008).

Claim 1 recites a temperature-controlled hot edge ring assembly adapted to surround a semiconductor substrate support in a plasma reaction chamber, the assembly comprising a conductive lower ring, a ceramic intermediate ring, the intermediate ring overlying the lower ring, the intermediate ring adapted to be attached via the lower ring to an RF electrode, and an upper ring, the upper ring overlying the intermediate ring, wherein the upper ring has an upper surface exposed to an interior of a plasma reaction chamber.

Claim 16 recites a plasma processing apparatus comprising a processing chamber, a power source which energizes process gas in an interior of the processing chamber into a plasma state for processing a substrate, a substrate support which supports a substrate within the interior of the processing chamber, a conductive lower ring, a ceramic intermediate ring, the intermediate ring overlying

the lower ring, the intermediate ring adapted to be attached via the lower ring to an RF electrode, and an upper ring, the upper ring overlying the intermediate ring, wherein the upper ring has an upper surface exposed to an interior of a plasma reaction chamber.

In the Official Action, it is stated that Hubacek "fails to teach a conductive lower ring" and that "Masuta et al. teaches a two-piece retaining ring wherein the top portion is made [of] a hard plastic (resin) and the lower portion is made of a metal, see Fig. 1B." The Official Action combines Masuta with Hubacek by alleging that "[t]he motivation to construct the ring of Hubacek with the lower conductive ring of Masuta is that the lower conductive portion provides more mechanical strength to the overall ring and allows for greater throughput [and thus] it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to incorporate the teachings of Masuta in the ring assembly of Hubacek et al." Applicants respectfully disagree that a person of ordinary skill in the art would have been led to combine teachings of Masuta's polishing apparatus with Hubacek's edge ring of a plasma processing chamber.

The combination of features recited in Claims 1 and 16 can provide improvements in temperature control during plasma processing in a plasma reaction chamber by conducting heat from an upper ring through a ceramic intermediate ring to an RF electrode by way of a conductive lower ring (see paragraphs 21, 28 and 33 of present application). Masuta is non-analogous art since Masuta does not relate to plasma processing but rather, chemical-mechanical polishing of semiconductor substrates (column 1, lines 1-20 of Masuta). The "lower conductive ring" of Masuta wherein a retainer ring 101 includes a lower resin portion 1012a of hard plastic and

an upper metal portion 101b of stainless steel (column 3, lines 53-56 of Masuta) is not part of a substrate support in a plasma processing chamber. As such, it is submitted that the Official Action does not set forth proper motivation or incentive to combine the non-analogous teachings of Masuta with Hubacek. Accordingly, withdrawal of the rejection is respectfully requested.

Claims 6 and 17 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Hubacek and Masuta et al. as applied to claims 1-6, 7-9, 14-16 23 and 24 above, and further in view of Zuniga et al. (US 6,251,215).

Claims 6 and 17 depend from Claims 1 and 12 and thus are patentable for at least the reasons discussed above.

Claims 10-13, 17 and 22 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Hubacek and Masuta et al. as applied to claims 1-6, 7-9, 14-16 23 and 24 above, and in view of Koai et al. (US 6,159,299).

Claims 10-13, 17 and 22 depend from Claims 1 and 12 and thus are patentable for at least the reasons discussed above.

Conclusion

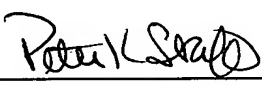
Based on the reasons as set forth above, Applicants respectfully request allowance of pending claims 1-25.

In the event that there are any questions concerning this paper, or the application in general, the Examiner is respectfully urged to telephone Applicants' undersigned representative so that prosecution of the application may be expedited.

Respectfully submitted,

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